

## CLAIMS

What is claimed is:

- 1 1. A method for authenticating messages communicated between partners that belong to  
2 a plurality of partners, the method comprising the steps of:  
3 maintaining at a trusted intermediary a signature decryption key for each partner of  
4 said plurality of partners that is authorized to use said trusted intermediary to  
5 send messages;  
6 receiving at said trusted intermediary messages originated by partners of said plurality  
7 of partners that are intended for other partners of said plurality of partners;  
8 for each message thus received, the trusted intermediary performing the steps of  
9 using the signature decryption key associated with the partner that sent the  
10 message to determine whether the message was actually sent by that  
11 partner; and  
12 if the message was actually sent by that partner, then sending the message to  
13 the partner for which the message is intended along with a digital  
14 signature of said trusted intermediary to indicate that the trusted  
15 intermediary has verified that the message was actually sent by the  
16 partner that sent the message.
- 1 2. The method of Claim 1 wherein the signature decryption key for each partner of said  
2 plurality of partners is a public signature decryption key associated with a private  
3 signature creation key.

1 3. The method of Claim 1 wherein the signature decryption key for each partner of said  
2 plurality of partner is used to decrypt a digital signature associated with a message  
3 that is sent along with the digital signature.

1 4. The method of Claim 1 wherein the digital signature of the trusted intermediary is  
2 associated with a message that is sent along the digital signature of the trusted  
3 intermediary.

1 5. The method of Claim 1 wherein the digital signature of the trusted intermediary is  
2 encrypted by a private signature creation key associated with a public signature  
3 decryption key.

1 6. A computer-readable medium storing computer code for causing a computer to  
2 perform a method for authenticating messages communicated between partners that  
3 belong to a plurality of partners, by the steps of:  
4 maintaining at a trusted intermediary a signature decryption key for each  
5 partner of said plurality of partners;  
6 receiving at said trusted intermediary messages originated by partners of said  
7 plurality of partners that are intended for other partners of said  
8 plurality of partners;  
9 for each message thus received, the trusted intermediary performing the steps  
10 of

11 using the signature decryption key associated with the partner that sent  
12 the message to determine whether the message was actually  
13 sent by that partner; and  
14 if the message was actually sent by that partner, then sending the  
15 message to the partner for which the message is intended along  
16 with a digital signature of said trusted intermediary to indicate  
17 that the trusted intermediary has verified that the message was  
18 sent actually sent by the partner that sent the message.

1 7. The computer-readable medium of Claim 6 wherein the signature decryption key for  
2 each partner is a public signature decryption key associated with a private signature  
3 creation key.

1 8. The computer-readable medium of Claim 6 wherein the signature decryption key for  
2 each partner is used to decrypt a digital signature associated with a message is that  
3 sent along with the digital signature.

1 9. The computer-readable medium of Claim 6 wherein the digital signature of the trusted  
2 intermediary is associated with a message that is sent along with the digital signature.

1 10. The computer-readable medium of Claim 6 wherein the digital signature of the trusted  
2 intermediary is encrypted by a private signature creation key associated with a public  
3 signature decryption key.

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11. A computer for use in communications between partners that belong to a plurality of partners, comprising:

storage means configured to store a signature decryption key for each partner of said plurality of partners that is authorized to use said computer to send messages;

receiving means configured to receive messages that are originated by partners of said plurality of partners and that are intended for other partners of said plurality of partners;

signature decryption means; and

sending means; wherein

for each message thus received,

said signature decryption means is configured to use the signature decryption key associated with the partner that sent the message to determine whether the message was actually sent by that partner; and

if the message was actually sent by that partner, said sending means is configured to send the message along with a digital signature of said trusted intermediary to the partner for which the message is intended; wherein said digital signature of said trusted intermediary is used to indicate that said trusted intermediary has verified that the message was actually sent by the partner that sent the message.

1 12. The computer of claim 11 further comprising signature encryption means by which  
2 said digital signature of said trusted intermediary was created.

1 13. A computer network for use in communications between partners that belong to a  
2 plurality of partners, comprising:

3 a plurality of computers each of which is configured to store a respective  
4 signature creation key of a partner of said plurality of partners that is  
5 authorized to use a trusted intermediary computer to send messages;

6 wherein said trusted intermediary computer is configured

7 to store a plurality of signature decryption keys each of which

8 corresponds to the respective signature creation key that is

9 stored in each of said plurality of computers;

10 wherein, upon receiving messages that are originated by partners of said

11 plurality of partners and that are intended for other partners of said

12 plurality of partners, said trusted intermediary computer, for each

13 message thus received, is configured

14 to use the signature decryption key associated with the partner

15 that sent the message to determine whether the message

16 was actually sent by that partner; and

17 if the message was actually sent by that partner, then sending

18 the message to the partner for which the message is

19 intended along with a digital signature of said trusted

20 intermediary to indicate that the trusted intermediary

21 has verified that the message was actually sent by that  
22 partner that sent the message.

1 14. A method for a trusted intermediary to manage keys used in communications between  
2 partners that belong to a plurality of partners, the method comprising the steps of:  
3 a trusted intermediary maintaining a message encryption key for each partner  
4 of said plurality of partners that is authorized to use said trusted  
5 intermediary to receive messages; wherein  
6 upon receiving messages that are originated by partners of said plurality of  
7 partners and that are intended for other partners of said plurality of  
8 partners, said trusted intermediary, for each message thus received,  
9 performing the steps of  
10 encrypting the message using the message encryption key  
11 associated with the partner for which the message is  
12 intended; and  
13 sending the encrypted message to the partner for which the  
14 message is intended.

1 15. The method of Claim 14 wherein the message encryption key for each partner of said  
2 plurality of partners is a public message encryption key associated with a private  
3 message decryption key.

1 16. The method of Claim 14 wherein each of the messages that are originated by partners  
2 of said plurality of partners and that are intended for other partners of said plurality of

3 partners was encrypted using a message encryption key associated with the trusted  
4 intermediary.

1 17. The method of Claim 16 wherein said message encryption key associated with said  
2 trusted intermediary is a public message encryption key that is associated with a  
3 private message decryption key.

1 18. A computer-readable medium storing computer code for causing a computer to  
2 perform a method for a trusted intermediary to manage keys used in communications  
3 between partners that belong to a plurality of partners, by the steps of:

4 said trusted intermediary maintaining a message encryption key for each

5 partner of said plurality of partners that is authorized to use said

6 trusted intermediary to receive messages; wherein

7 upon receiving messages originated by partners of said plurality of partners

8 that are intended for other partners of said plurality of partners, said

9 trusted intermediary, for each message thus received, performing the

10 steps of

11 encrypting the message using the message encryption key

12 associated with the partner for which the message is

13 intended; and

14 sending the encrypted message to the partner for which the

15 message is intended.

1 19. The computer-readable medium of Claim 18 wherein the message encryption key for  
2 each partner of said plurality of partners is a public message encryption key  
3 associated with a private message decryption key.

1 20. The computer-readable medium of Claim 18 wherein the computer further performs  
2 the step of:

3 each partner of said plurality of partners that sends messages to said trusted  
4 intermediary maintains a message encryption key associated with a  
5 message decryption key of said trusted intermediary.

1 21. The computer-readable medium of Claim 20 wherein said message encryption key  
2 associated with said message decryption key of said trusted intermediary is a public  
3 message encryption key and said message decryption key of said trusted intermediary  
4 is a private message decryption key.

1 22. A computer for use in communications between partners that belong to a plurality of  
2 partners, comprising:

3 storage means configured to store a message encryption key for each partner  
4 of said plurality of partners that is authorized to use said computer to  
5 receive messages;  
6 message encryption means;  
7 sending means; and



receiving means configured to receive messages that are originated by  
partners of said plurality of partners and that are intended for other  
partners of said plurality of partners; wherein  
for each message thus received,  
said message encryption means encrypts the message using the  
message encryption key associated with the partner for which  
the message is intended; and  
said sending means sends the encrypted message to the partner for  
which the message is intended.

23. The computer system of claim 22 further comprising message decryption means that,  
for each message thus received, produces that message from an encrypted message.

24. A computer network for use in communications between partners that belong to a  
plurality of partners, comprising:  
a plurality of computers each of which is configured to store a respective  
message decryption key of a partner of said plurality of partners that is  
authorized to use a trusted intermediary computer to receive messages;  
wherein said trusted intermediary computer is configured  
to store a plurality of message encryption keys each of which  
corresponds to the respective message decryption key that is  
stored in each of said plurality of computers;  
wherein, upon receiving messages that are originated by partners of said  
plurality of partners and that are intended for others partners of said

12 plurality of partners, said trusted intermediary computer, for each  
13 message thus received, is configured  
14 to encrypt the message using the message encryption key  
15 associated with the partner for which the message is  
16 intended, and  
17 to send the encrypted message to the partner for which the  
18 message is intended.

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